

### **Amendments to the Claims**

1. (Currently Amended) A header compression apparatus for compressing a header of a packet to be transmitted by referring to reference information that is also included in a receiving side, said apparatus comprising:

a reference information manager operable to store and manage said reference information;

a packet compressor operable to compress the header of the packet in a specified operation mode by referring to said reference information, and to selectively add, to the compressed packet, update information for updating the reference information at the receiving side;

a packet transmitter operable to transmit the packet compressed by said packet compressor;

a packet receiver operable to receive an ACK packet indicating that the reference information at the receiving side has been correctly updated or a NACK packet for requesting transmission of said update information due to a header decompression error that occurred at the receiving side; and

a mode determination unit operable to switch the operation mode of said packet compressor to a reliable mode where, after the reference information of the header compression apparatus is updated, said packet compressor continuously adds said update information until the ACK packet is received, and to an optimistic mode where said packet compressor adds said update information when the reference information of the header compression apparatus is updated and whenever receiving the NACK packet, wherein

when said operation mode is the optimistic mode and the number of NACK packets received by a unit time X is larger than a predetermined value Y, said mode

determination unit switches said operation mode to the reliable mode, and when said operation mode is the reliable mode and the number of ACK packets received by the unit time X is larger than a predetermined value Z, said mode determination ~~means~~ unit switches said operation mode to the optimistic mode.

2. (Previously Presented) The header compression apparatus according to claim 1, wherein

said mode determination unit calculates a rate of change in the number of NACK packets or ACK packets received by the unit time X, and increases the unit time X when said rate of change is smaller than a predetermined value A, and decreases the unit time X when said rate of change is larger than a predetermined value B.

3. (Previously Presented) A header decompression apparatus for decompressing a header of a received packet by referring to reference information that is also included in a transmitting side, said apparatus comprising:

a reference information manager operable to store and manage said reference information;

a packet receiver operable to receive the packet with update information selectively added thereto for updating said reference information;

a packet decompressor, provided with the packet received by said packet receiver, operable to update said reference information by using said update information, and to decompress the header of the packet by referring to said reference information;

a packet transmitter operable to transmit an ACK packet indicating that said reference information has been correctly updated or a NACK packet for requesting transmission

of said update information when a header decompression error occurs in said packet decompressor;

a mode determination unit operable to switch the operation mode of the transmitting side to a reliable mode where, after updating the reference information of the transmitting side, the transmitting side continuously adds said update information until receiving the ACK packet, and to an optimistic mode where the transmitting side adds said update information when the reference information of the transmitting side is updated and whenever receiving the NACK packet; and

a mode notification unit operable to notify the transmitting side of said operation mode selected by said mode determination unit, wherein

said mode determination unit counts the number of header decompression errors that occurred by a unit time X in said packet decompressor, and, when said operation mode is the optimistic mode and said number is larger than a predetermined value Y, said mode determination unit switches said operation mode to the reliable mode, and when said operation mode is the reliable mode and said number is smaller than a predetermined value Z, said mode determination unit switches said operation mode to the optimistic mode.

4. (Previously Presented) The header decompression apparatus according to claim 3, wherein

said mode determination unit calculates a rate of change in said number by the unit time X, and increases the unit time X when said rate of change is smaller than a predetermined value A, and decreases the unit time X when said rate of change is larger than a predetermined value B.

5. (Previously Presented) A header compression apparatus for compressing a header of a packet to be transmitted by referring to reference information that is also included in a receiving side, said apparatus comprising:

a reference information manager operable to store and manage said reference information;

a packet compressor operable to compress the header of the packet in a specified operation mode by referring to said reference information, and to selectively add, to the compressed packet, update information for updating the reference information at the receiving side;

a packet transmitter operable to transmit the packet compressed by said packet compressor;

a packet receiver operable to receive an ACK packet indicating that the reference information at the receiving side has been correctly updated or a NACK packet for requesting transmission of said update information due to a header decompression error that occurred at the receiving side;

a delay time measuring unit operable to measure a roundtrip delay time with respect to the receiving side by transmitting and receiving a packet to and from the receiving side; and

a mode determination unit operable to switch the operation mode of said packet compressor to a reliable mode where, after the reference information of the header compression apparatus is updated, said packet compressor continuously adds said update information until the ACK packet is received, and an optimistic mode where said packet compressor adds said update information when the reference information of the transmitting side is updated and whenever receiving the NACK packet, wherein

said mode determination unit receives, by a unit time X, said roundtrip delay time from said delay time measuring unit, and switches said operation mode to the reliable mode when said operation mode is the optimistic mode and said roundtrip delay time is smaller than a predetermined value Y, and to the optimistic mode when said operation mode is the reliable mode and said roundtrip delay time is larger than a predetermined value Z.

6. (Previously Presented) The header compression apparatus according to claim 5, wherein

said mode determination unit calculates a rate of change in said roundtrip delay time, and increases the unit time X when said rate of change is smaller than a predetermined value A, and decreases the unit time X when said rate of change is larger than a predetermined value B.

7. (Previously Presented) A header decompression apparatus for decompressing a header of a received packet by referring to reference information that is also included in a transmitting side, said apparatus comprising:

a reference information manager operable to store and manage said reference information;

a packet receiver operable to receive the packet with update information selectively added thereto for updating said reference information;

a packet decompressor, provided with the packet received by said packet receiver, operable to update said reference information by using said update information, and to decompress the header of the packet by referring to said reference information;

a packet transmitter operable to transmit an ACK packet indicating that said

reference information has been correctly updated or a NACK packet for requesting transmission of said update information when a header decompression error occurs in said packet decompressor;

a delay time measuring unit operable to measure a roundtrip delay time with respect to the transmitting side by transmitting and receiving a packet to and from the transmitting side;

a mode determination unit operable to switch the operation mode of the transmitting side to a reliable mode where, after updating the reference information of the transmitting side, the transmitting side continuously adds said update information until receiving the ACK packet, and to an optimistic mode where the transmitting side adds said update information when the reference information of the transmitting side is updated and whenever receiving the NACK packet; and

a mode notification unit operable to notify the transmitting side of said operation mode selected by said mode determination unit, wherein

said mode determination unit receives, by a unit time X, said roundtrip delay time from said delay time measuring unit, and switches said operation mode to the reliable mode when said operation mode is the optimistic mode and said roundtrip delay time is smaller than a predetermined value Y, and to the optimistic mode when said operation mode is the reliable mode and said roundtrip delay time is larger than a predetermined value Z.

8. (Previously Presented) The header decompression apparatus according to claim 7, wherein

said mode determination unit calculates a rate of change in said roundtrip delay time measured by the unit time X, and increases the unit time X when said rate of change is

smaller than a predetermined value A, and decreases the unit time X when said rate of change is larger than a predetermined value B.

9. (Previously Presented) A header compression method of compressing a header of a packet to be transmitted by referring to reference information that is also included in a receiving side, said method comprising:

compressing a packet by compressing the header of the packet in a specified operation mode by referring to said reference information stored, and selectively adding, to the compressed packet, update information for updating the reference information at the receiving side;

transmitting the packet compressed in said compressing a packet;

receiving an ACK packet indicating that the reference information at the receiving side has been correctly updated or a NACK packet for requesting transmission of said update information due to a header decompression error that occurred at the receiving side; and

switching the operation mode of said compressing a packet to a reliable mode where, after said reference information is updated, said update information is continuously added until the ACK packet is received, and to an optimistic mode where said update information is added when said reference information is updated and whenever the NACK packet is received, wherein

in said switching, when said operation mode is the optimistic mode and the number of NACK packets received by a unit time X is larger than a predetermined value Y, said operation mode is switched to the reliable mode, and when said operation mode is the reliable mode and the number of ACK packets received by the unit time X is larger than a predetermined value Z, said operation mode is switched to the optimistic mode.

10. (Previously Presented) The header compression method according to claim 9, wherein

in said switching, a rate of change in the number of NACK packets or ACK packets received by the unit time X is calculated, and the unit time X is increased when said rate of change is smaller than a predetermined value A, and decreased when said rate of change is larger than a predetermined value B.

11. (Previously Presented) A header decompression method of decompressing a header of a received packet by referring to reference information that is also included in a transmitting side, said method comprising:

receiving the packet with update information selectively added thereto for updating said reference information stored;

decompressing a packet received during said receiving, by updating said reference information by using said update information, and decompressing the header of the packet by referring to said reference information;

transmitting an ACK packet indicating that said reference information has been correctly updated or a NACK packet for requesting transmission of said update information when a header decompression error occurs in said decompressing a packet;

switching the operation mode of the transmitting side to a reliable mode where, after updating the reference information of the transmitting side, the transmitting side continuously adds said update information until receiving the ACK packet, and to an optimistic mode where the transmitting side adds said update information when the reference information of the transmitting side is updated and whenever receiving the NACK packet; and

notifying the transmitting side of said operation mode selected in said switching, wherein

in said switching, the number of header decompression errors that occurred by a unit time X in said decompressing a packet is counted and, when said operation mode is the optimistic mode and said number is larger than a predetermined value Y, said operation mode is switched to the reliable mode, and when said operation mode is the reliable mode and said number is smaller than a predetermined value Z, said operation mode is switched to the



optimistic mode.

12. (Previously Presented) The header decompression method according to claim 11, wherein

in said switching, a rate of change in said number by the unit time X is calculated, and the unit time X is increased when said rate of change is smaller than a predetermined value A, and decreased when said rate of change is larger than a predetermined value B.

13. (Previously Presented) A header compression method of compressing a header of a packet to be transmitted by referring to reference information that is also included in a receiving side, said method comprising:

compressing a packet by compressing the header of the packet in a specified operation mode by referring to said reference information stored, and selectively adding, to the compressed packet, update information for updating the reference information at the receiving side;

transmitting the packet compressed in said compressing a packet;

receiving an ACK packet indicating that the reference information at the receiving side has been correctly updated or a NACK packet for requesting transmission of said update information due to a header decompression error that occurred at the receiving side;

measuring a roundtrip delay time with respect to the receiving side by transmitting and receiving a packet to and from the receiving side; and

switching the operation mode of said compressing a packet to a reliable mode where, after the reference information to be referred to is updated, said update information is continuously added until the ACK packet is received, and to an optimistic mode where said update information is added when the reference information is updated and whenever the NACK packet is received, wherein

in said switching, said roundtrip delay time measured by a unit time X in said measuring is provided and, when said operation mode is the optimistic mode and said roundtrip delay time is smaller than a predetermined value Y, said operation mode is switched to the reliable mode, and when said operation mode is the reliable mode and said roundtrip delay time

is larger than a predetermined value Z, said operation mode is switched to the optimistic mode.

14. (Previously Presented) The header compression method according to claim 13, wherein

in said switching, a rate of change in said roundtrip delay time measured by the unit time X is calculated, and the unit time X is increased when said rate of change is smaller than a predetermined value A, and decreased when said rate of change is larger than a predetermined value B.

15. (Previously Presented) A header decompression method of decompressing a header of a received packet by referring to reference information that is also included in a transmitting side, said method comprising:

receiving the packet with update information selectively added thereto for updating said reference information stored;

decompressing a packet received during said receiving, by updating said update information by using said update information, and decompressing the header of the packet by referring to said reference information;

transmitting an ACK packet indicating that said reference information has been correctly updated or a NACK packet for requesting transmission of said update information when a header decompression error occurs in said decompressing a packet;

measuring a roundtrip delay time with respect to the transmitting side by transmitting and receiving a packet to and from the transmitting side;

switching the operation mode of the transmitting side to a reliable mode where, after updating the reference information of the transmitting side, the transmitting side continuously adds said update information until receiving the ACK packet, and to an optimistic mode where the transmitting side adds said update information when the reference information of the transmitting side is updated and whenever receiving the NACK packet; and

notifying the transmitting side of said operation mode selected in said switching, wherein

in said switching, said roundtrip delay time measured by a unit time X in said

measuring is received, and said operation mode is switched to the reliable mode when said operation mode is the optimistic mode and said roundtrip delay time is smaller than a predetermined value Y, and to the optimistic mode when said operation mode is the reliable mode and said roundtrip delay time is larger than a predetermined value Z.

16. (Previously Presented) The header decompression method according to claim 15, wherein

in said switching, a rate of change in said roundtrip delay time measured by the unit time X is calculated, and the unit time X is increased when said rate of change is smaller than a predetermined value A, and decreased when said rate of change is larger than a predetermined value B.